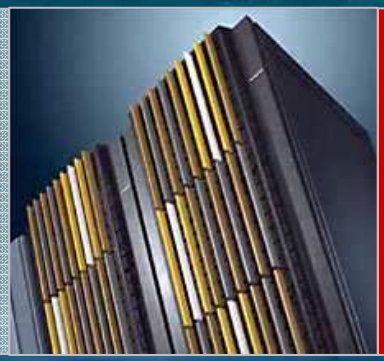

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BladeSymphony

Gelato ICE Presentation

BladeSymphony with Virtage

April 17, 2007

Hitachi America, Ltd

Introduction

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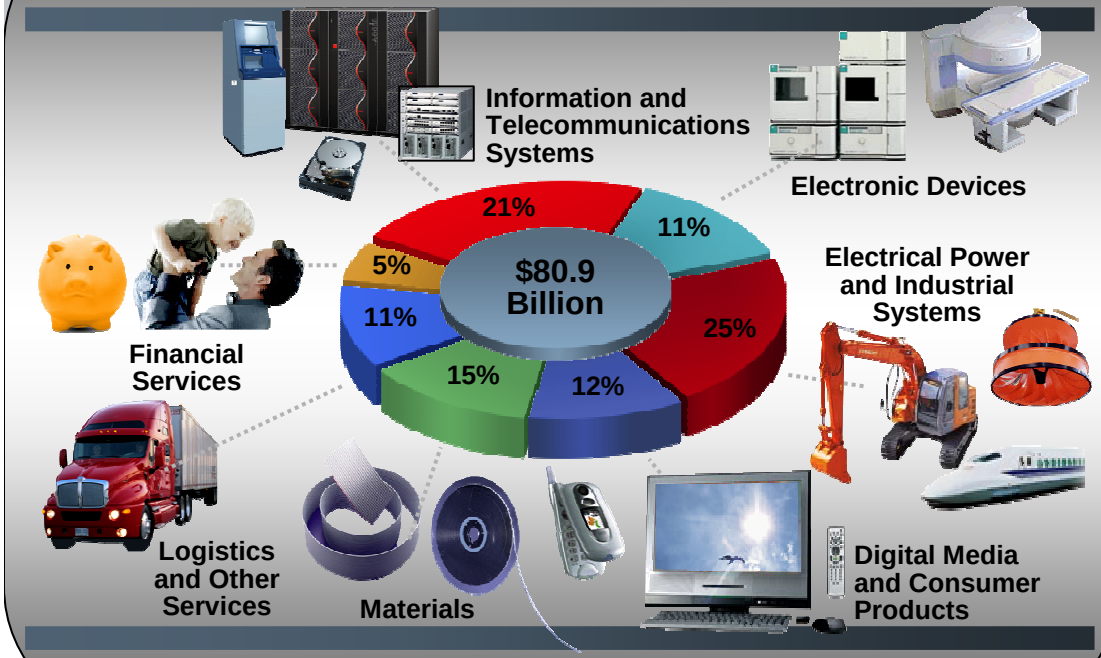
Hitachi America, Ltd. (HAL)

Server Systems Group (SSG)

- **BladeSymphony Sales & Support,**
- **North America**

Paul Figliozzi
Chief Systems Architect
(Technical Guy?)

Hitachi: A Global Company



BladeSymphony 1000

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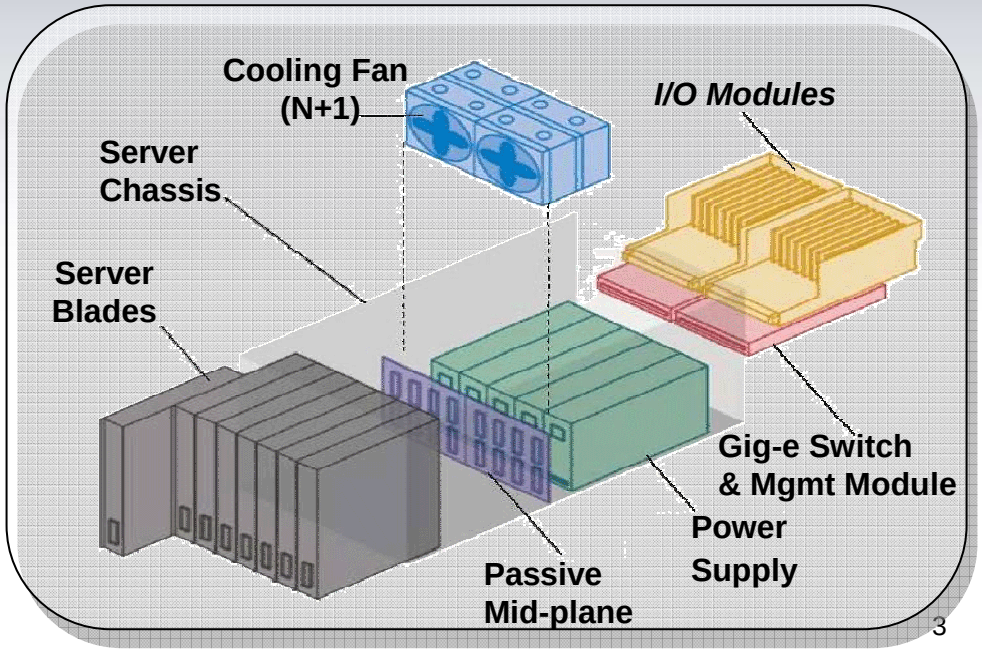
Enterprise-class Blade Server

Chassis Specifications

- *19” Rack mount chassis (10 EIA units)*
- *(8) Blade Server Slots*
- *(2) 8-slot I/O Modules (PCI-X or PCI-e)*
- *(2) Layer 2 Gigabit Switches*
- *Remote Service Console*



Modular Design

- *Cooling Fans (N+1)*
- *(5) power Supplies (N+1)*
- *Passive mid-plane*
- *Modular assembly*

Blade Server Modules

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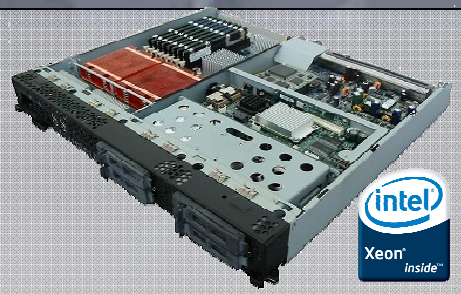
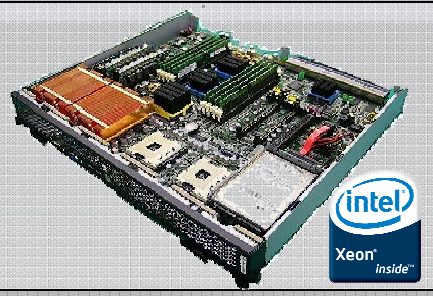
Hitachi Blade Architecture

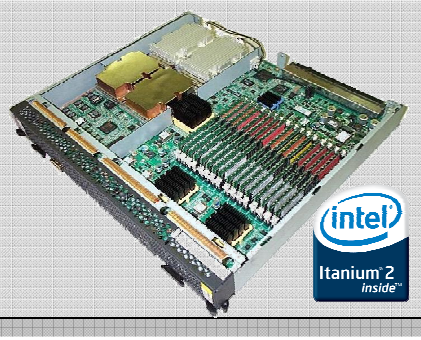
- ***Intel® Xeon® Blade, 2 Socket***
  - *Dual or Quad Core Processor*
  - *Storage – Four 2.5" SAS Drives*
  - *Memory – 8 DIMM slots, Up to 16GB (2GB DIMMs)*



- ***Intel® Xeon® Blade, 4 Socket***
  - *Size - Identical to 2-sockets blades*
  - *Performance - Supporting latest Xeon MP Processors*
  - *Density – Up to 96 processors on a standard 40U rack*



- ***Intel® Itanium2® Blade, 2 Socket***
  - *Madison (single) or Montecito (dual) core*
  - *Memory – 16 DIMM slots, 32 GB max/blade*



All blade modules have two on-board Gig-e NICs

SMP Blade Interconnect
(Itanium® Blades Only)

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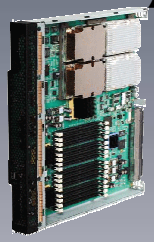
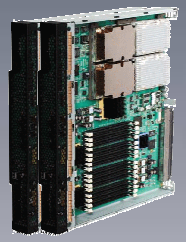
Single (default)



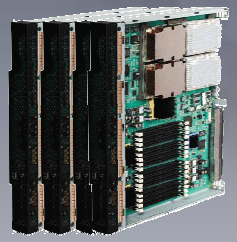
2 slot, 4 core
2 NIC, 2 PCI
32 GB Memory

Dual (Duet) Interconnect



4 slot, 8 core
4 NIC, 4 PCI
64 GB Memory

Quartet Interconnect



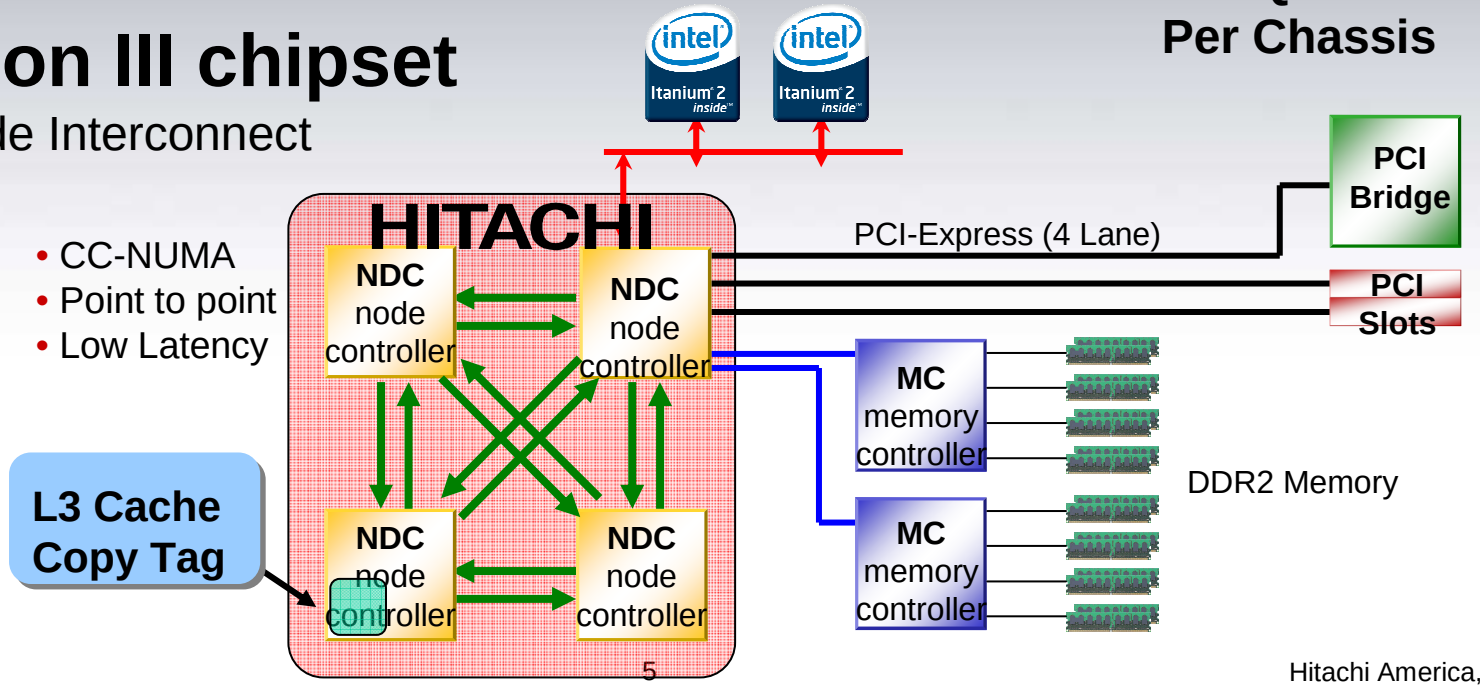
8 slot, 16 core
8 NIC, 8 PCI
128 GB Memory

Two Quartets Per Chassis

Cold Fusion III chipset

Scales to 4 Blade Interconnect

- CC-NUMA
- Point to point
- Low Latency



IA64 Operating Systems

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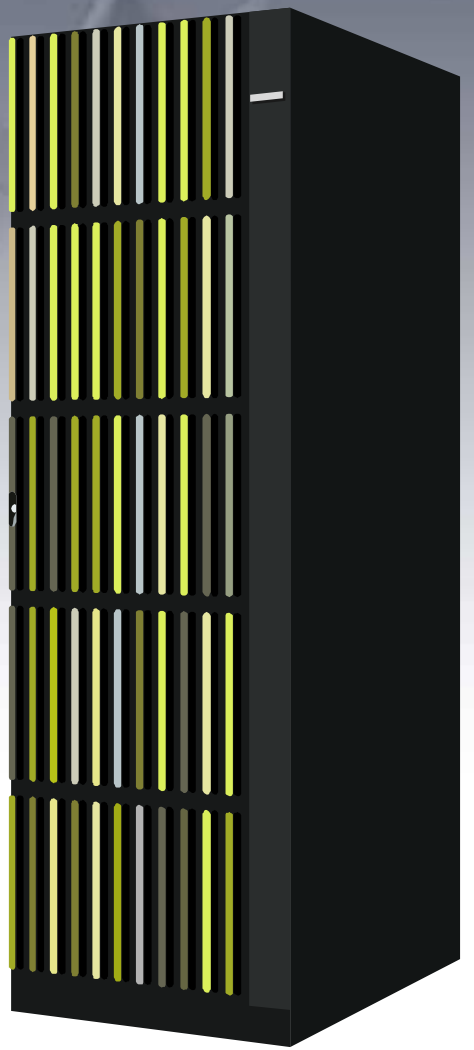
Red Hat Enterprise Linux
(rhel-ia64-as-4 u3)

SuSE Linux Enterprise Server
(SLES-10-ia64)

Microsoft Windows Server 2003



Virtage

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Blade Interconnect

- Blade interconnect technology improves scalability
  - Multiple blade servers configured to work as a single SMP system
  - Enterprise-class data center functionality

Embedded Virtualization

- Virtualization embedded in the firmware
  - Improved flexibility
  - Improved versatility
  - Improved performance
  - High utilization

Run Critical Apps at High Performance

- Lower overhead = higher performance
- More stable and reliable
- More manageable

Virtage

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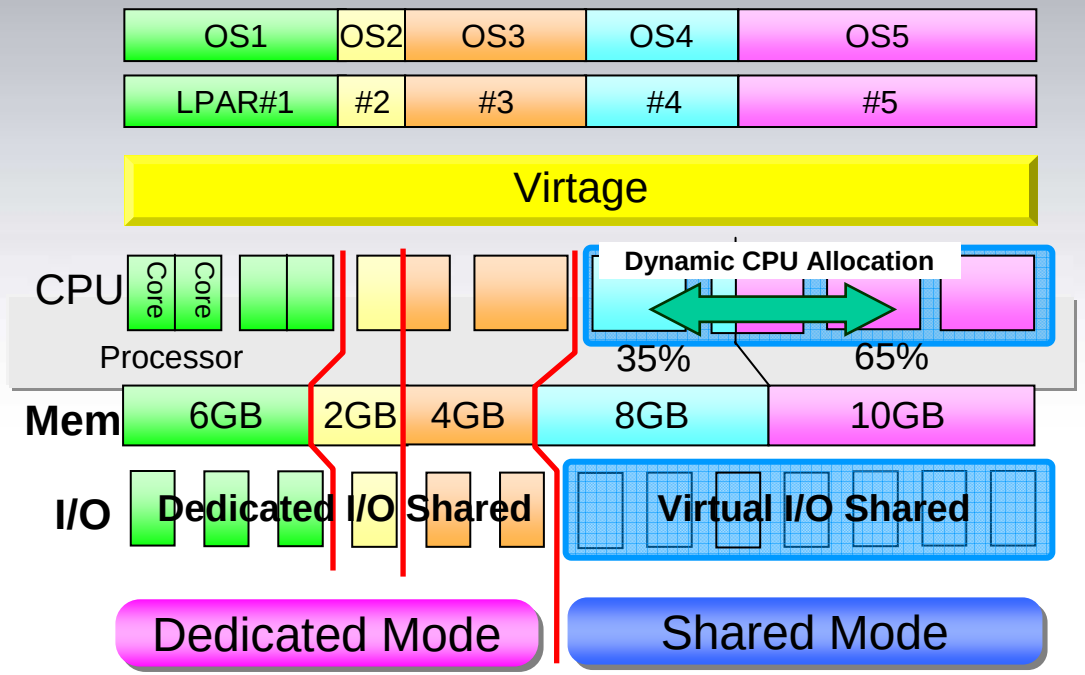
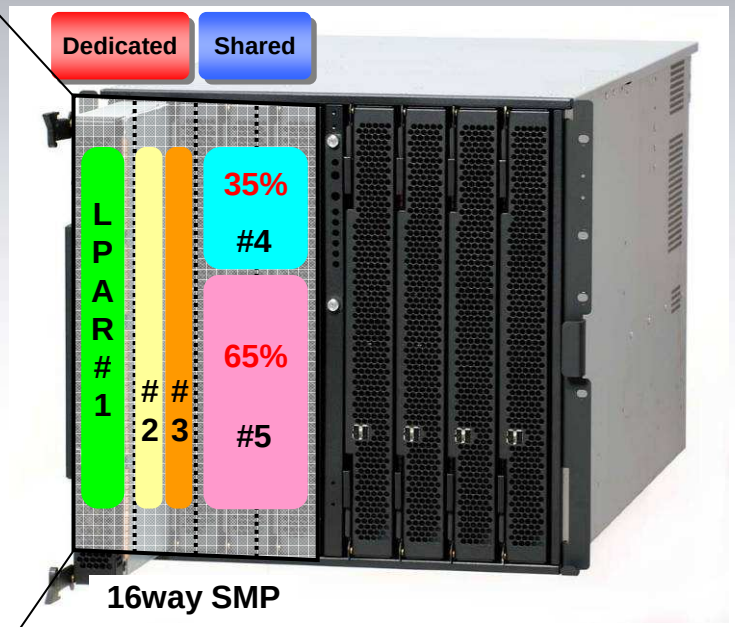
- Dedicated Mode: Assign CPUs exclusively for performance
- Shared Mode: Share resources for flexibility





16way SMP

Itanium2 Server Blade

Applications

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- Intel Developer's Forum (IDF) Keynote Demo
- Stanford CBRL – 3D Imaging, Simulation, 3 Chassis, 96 Core, GRID
- Hybrid Xeon/IPF – PXE-boot, NFS root, compile engine
- App-in-a-box – ERP, BI, Multi-tier application environments in a single chassis x 2 chassis for HA redundancy
- Various monolithic and grid-type applications (FFT,CFD encode/decode, compression)

IDF Keynote Demo (Virtage + 2x2 Interconnect)

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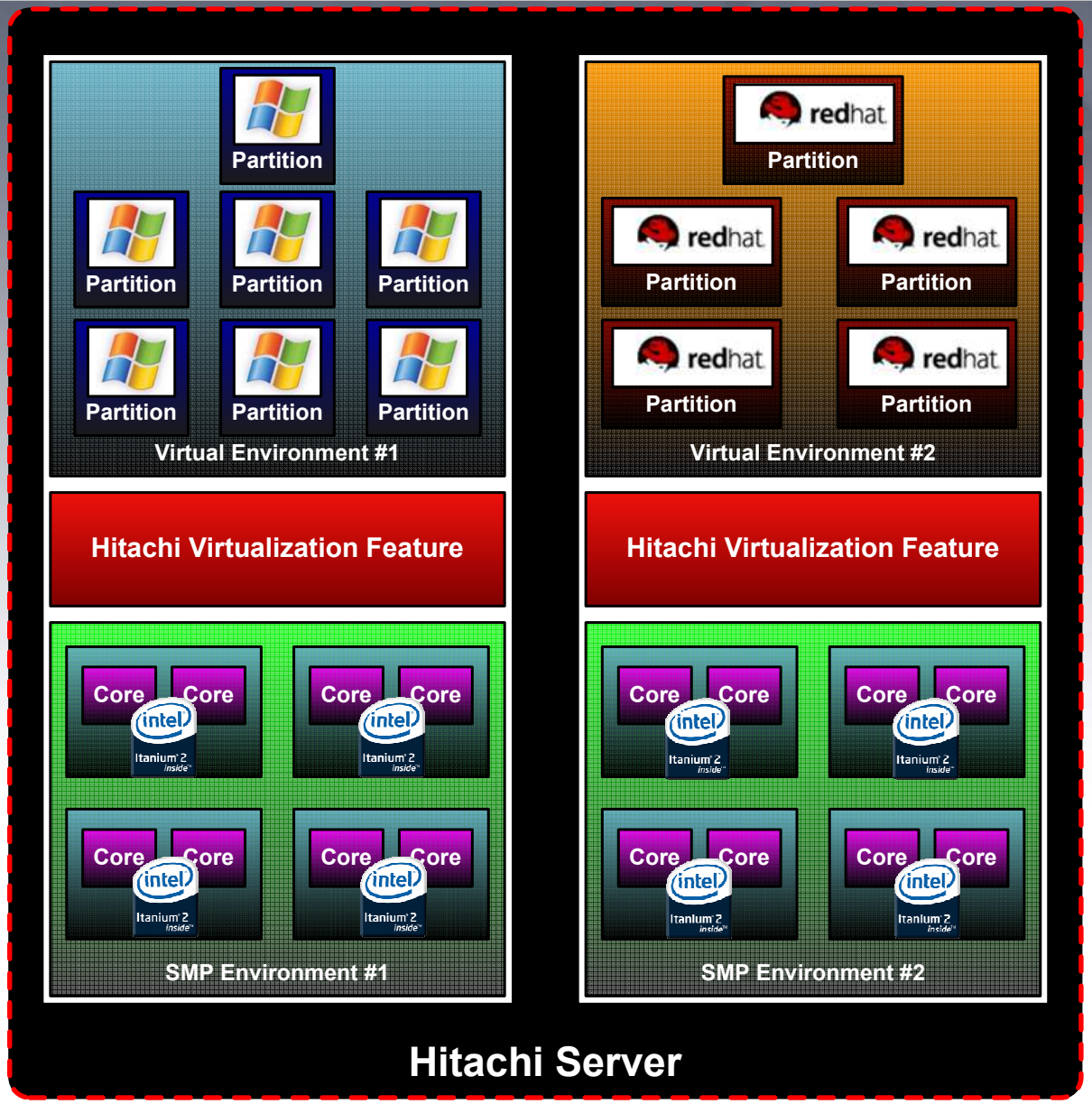
Seven Small SQL Server DB's

Sharing processor & I/O resources



#1 Oracle
IA64 Native

#2 Clients
QuickTransit

#3 IBM MQ Series
QuickTransit

#4 DB2
QuickTransit

#5 Apache
IA64 Native

IDF Proof-of-Concept Demo

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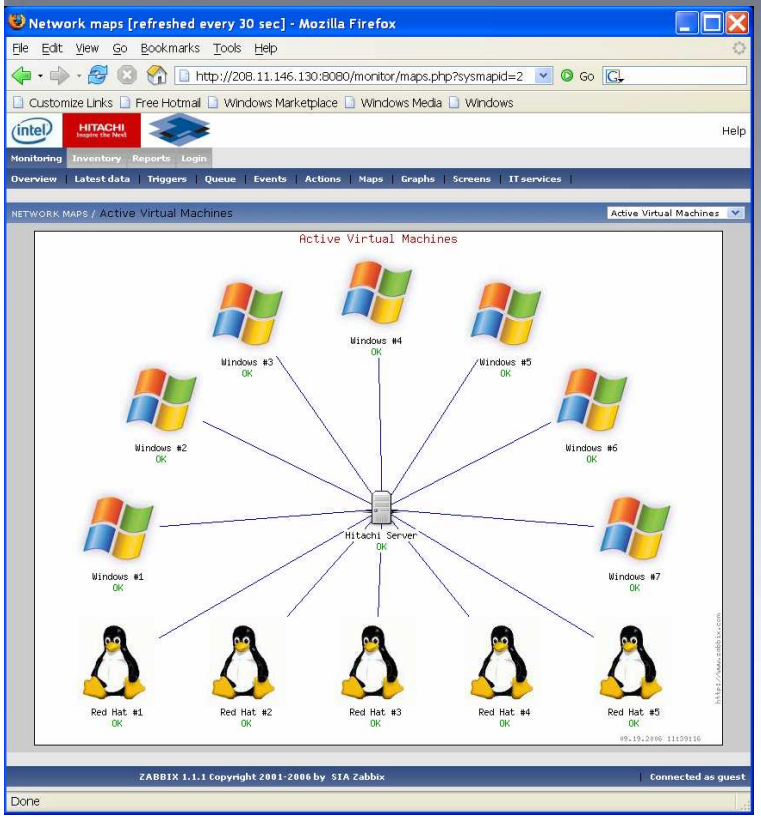

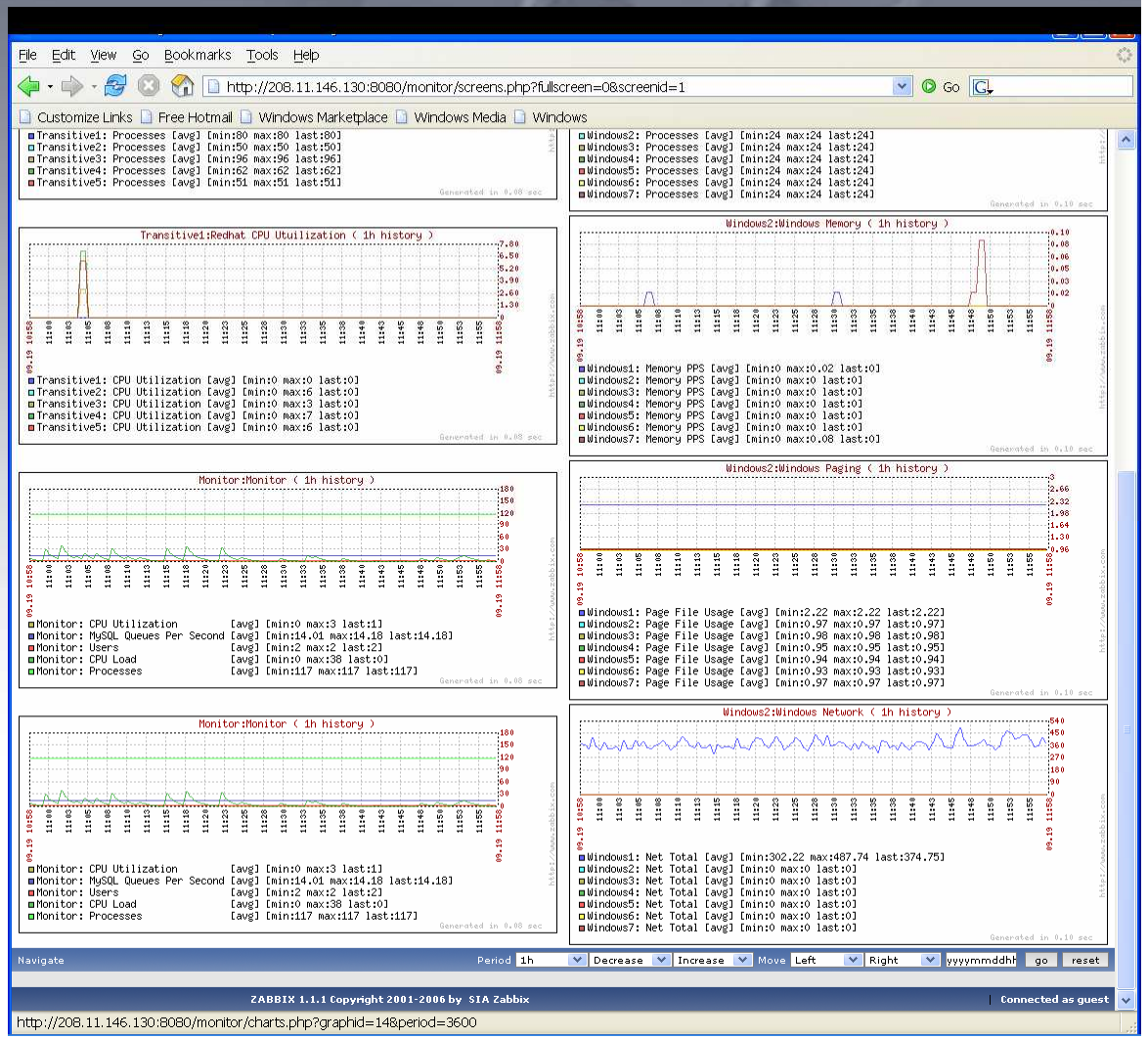

Thank you!

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Customer References

"As CBRL's procedures require such intensive computing needs, we have not typically looked at blade servers. Our work involves providing cardiologists and surgeons with the ability to simulate blood flow in patient-specific arterial models and predict outcomes of candidate interventions. Hitachi's BladeSymphony with Virtage provides us with all the enterprise-class capabilities we need - performance, scalability, and built-in virtualization - in a cost-effective, easier-to-use blade server. It was an easy decision that meets all of our high-performance computing needs."

Dr. Charles Taylor

Cardiovascular Biotechnology Research Lab - Stanford University

"Blade Symphony gave us high availability for our most critical financial service applications at a low cost. It really is the optimal infrastructure to support our business strategy."

Hiroshi Shirokawa
Higo Bank